RAW SEQUENCE LISTING   DATE: 08/23/2004
PATENT APPLICATION: US/09/754,014A   TIME: 16:08:38

Input Set : A:\09-754,014.txt
Output Set: N:\CRF4\08232004\I754014A.raw

```
 3 <110> APPLICANT: Valentis, Inc.
 4        Nordstrom, Jeff
 5        Freimark, Bruce
 6        Deshpande, Deepa
 8 <120> TITLE OF INVENTION: Gene Expression and Delivery Systems and Uses
10 <130> FILE REFERENCE: 213-0063US
12 <140> CURRENT APPLICATION NUMBER: US 09/754,014A
13 <141> CURRENT FILING DATE: 2001-01-03
15 <150> PRIOR APPLICATION NUMBER: US 08/948,958
16 <151> PRIOR FILING DATE: 1997-10-10
18 <150> PRIOR APPLICATION NUMBER: US 60/028,687
19 <151> PRIOR FILING DATE: 1996-10-10
21 <160> NUMBER OF SEQ ID NOS: 19
23 <170> SOFTWARE: PatentIn version 3.3
25 <210> SEQ ID NO: 1
26 <211> LENGTH: 328
27 <212> TYPE: PRT
28 <213> ORGANISM: Homo sapiens
30 <400> SEQUENCE: 1
32 Met Cys His Gln Gln Leu Val Ile Ser Trp Phe Ser Leu Val Phe Leu
33 1               5                   10                  15
36 Ala Ser Pro Leu Val Ala Ile Trp Glu Leu Lys Lys Asp Val Tyr Val
37             20                  25                  30
40 Val Glu Leu Asp Trp Tyr Pro Asp Ala Pro Gly Glu Met Val Val Leu
41         35                  40                  45
44 Thr Cys Asp Thr Pro Glu Glu Asp Gly Ile Thr Trp Thr Leu Asp Gln
45     50                  55                  60
48 Ser Ser Glu Val Leu Gly Ser Gly Lys Thr Leu Thr Ile Gln Val Lys
49 65                  70                  75                  80
52 Glu Phe Gly Asp Ala Gly Gln Tyr Thr Cys His Lys Gly Gly Glu Val
53             85                  90                  95
56 Leu Ser His Ser Leu Leu Leu Leu His Lys Lys Glu Asp Gly Ile Trp
57             100                 105                 110
60 Ser Thr Asp Ile Leu Lys Asp Gln Lys Glu Pro Lys Asn Lys Thr Phe
61          115                 120                 125
64 Leu Arg Cys Glu Ala Lys Asn Tyr Ser Gly Arg Phe Thr Cys Trp Trp
65      130                 135                 140
68 Leu Thr Thr Ile Ser Thr Asp Leu Thr Phe Ser Val Lys Ser Ser Arg
69 145                 150                 155                 160
72 Gly Ser Ser Asp Pro Gln Gly Val Thr Cys Gly Ala Ala Thr Leu Ser
73             165                 170                 175
76 Ala Glu Arg Val Arg Gly Asp Asn Lys Glu Tyr Glu Tyr Ser Val Glu
77             180                 185                 190
```

```
 80 Cys Gln Glu Asp Ser Ala Cys Pro Ala Ala Glu Glu Ser Leu Pro Ile
 81         195             200             205
 84 Glu Val Met Val Asp Ala Val His Lys Leu Lys Tyr Glu Asn Tyr Thr
 85     210             215             220
 88 Ser Ser Phe Phe Ile Arg Asp Ile Ile Lys Pro Asp Pro Pro Lys Asn
 89 225             230             235             240
 92 Leu Gln Leu Lys Pro Leu Lys Asn Ser Arg Gln Val Glu Val Ser Trp
 93             245             250             255
 96 Glu Tyr Pro Asp Thr Trp Ser Thr Pro His Ser Tyr Phe Ser Leu Thr
 97             260             265             270
100 Phe Cys Val Gln Val Gln Gly Lys Ser Lys Arg Glu Lys Lys Asp Arg
101         275             280             285
104 Val Phe Thr Asp Lys Thr Ser Ala Thr Val Ile Cys Arg Lys Asn Ala
105     290             295             300
108 Ser Ile Ser Val Arg Ala Gln Asp Arg Tyr Tyr Ser Ser Ser Trp Ser
109 305             310             315             320
112 Glu Trp Ala Ser Val Pro Cys Ser
113             325
116 <210> SEQ ID NO: 2
117 <211> LENGTH: 987
118 <212> TYPE: DNA
119 <213> ORGANISM: homo sapiens
121 <400> SEQUENCE: 2
122 atgtgtcacc agcagttggt catctcttgg ttttccctgg ttttttctggc atctcccctc    60
124 gtggccatat gggaactgaa gaaagatgtt tatgtcgtag aattggattg gtatccggat   120
126 gcccctggag aaatggtggt cctcacctgt gacacccctg aagaagatgg tatcacctgg   180
128 accttggacc agagcagtga ggtcttaggc tctggcaaaa ccctgaccat ccaagtcaaa   240
130 gagtttggag atgctggcca gtacacctgt cacaaaggag gcgaggttct aagccattcg   300
132 ctcctgctgc ttcacaaaaa ggaagatgga atttggtcca ctgatatttt aaaggaccag   360
134 aaagaaccca aaaataagac ctttctaaga tgcgaggcca agaattattc tggacgtttc   420
136 acctgctggt ggctgacgac aatcagtact gatttgacat tcagtgtcaa aagcagcaga   480
138 ggctcttctg acccccaagg ggtgacgtgc ggagctgcta cactctctgc agagagagtc   540
140 agagggggaca acaaggagta tgagtactca gtggagtgcc aggaggacag tgcctgccca   600
142 gctgctgagg agagtctgcc cattgaggtc atggtggatg ccgttcacaa gctcaagtat   660
144 gaaaactaca ccagcagctt cttcatcagg gacatcatca acctgacccc acccaagaac   720
146 ttgcagctga agccattaaa gaattctcgg caggtggagg tcagctggga gtaccctgac   780
148 acctggagta ctccacattc ctacttctcc ctgacattct gcgttcaggt ccagggcaag   840
150 agcaagagag aaaagaaaga tagagtcttc acggacaaga cctcagccac ggtcatctgc   900
152 cgcaaaaatg ccagcattag cgtgcgggcc caggaccgct actatagctc atcttggagc   960
154 gaatgggcat ctgtgccctg cagttag                                       987
157 <210> SEQ ID NO: 3
158 <211> LENGTH: 987
159 <212> TYPE: DNA
160 <213> ORGANISM: artificial sequence
162 <220> FEATURE:
163 <223> OTHER INFORMATION: codon optimized Human IL-12 p40
165 <400> SEQUENCE: 3
166 atgtgccacc agcagctggt gatcagctgg ttcagcctgg tgttcctggc cagccccctg    60
168 gtggccatct gggagctgaa gaaggacgtg tacgtggtgg agctggactg gtaccccgac   120
```

RAW SEQUENCE LISTING   DATE: 08/23/2004
PATENT APPLICATION: US/09/754,014A   TIME: 16:08:38

Input Set : A:\09-754,014.txt
Output Set: N:\CRF4\08232004\I754014A.raw

```
170 gcccccggcg agatggtggt gctgacctgc gacacccccg aggaggacgg catcacctgg      180
172 accctggacc agagcagcga ggtgctgggc agcggcaaga ccctgaccat ccaggtgaag      240
174 gagttcggcg acgccggcca gtacacctgc cacaagggcg gcgaggtgct gagccacagc      300
176 ctgctgctgc tgcacaagaa ggaggacggc atctggagca ccgacatcct gaaggaccag      360
178 aaggagccca agaacaagac cttcctgcgc tgcgaggcca agaactacag cggccgcttc      420
180 acctgctggt ggctgaccac catcagcacc gacctgacct tcagcgtgaa gagcagcagg      480
182 ggcagcagcg acccccaggg cgtgacctgc ggcgccgcca ccctgagcgc cgagcgcgtg      540
184 cgcggcgaca acaaggagta cgagtacagc gtggagtgcc aggaggacag cgcctgcccc      600
186 gccgccgagg agagcctgcc catcgaggtg atggtggacg ccgtccacaa gctgaagtac      660
188 gagaactaca ccagcagctt cttcatccgc gacatcatca gcccgaccc ccccaagaac       720
190 ctgcagctga gcccctgaa gaacagccgc caggtggagg tgagctggga gtaccccgac        780
192 acctggagca cccccacag ctacttcagc ctgaccttct gcgtgcaggt gcagggcaag         840
194 agcaagcgcg agaagaagga ccgcgtgttc accgacaaga ccagcgccac cgtgatctgc      900
196 cgcaagaacg ccagcatcag cgtgcgcgcc caggaccgct actacagcag cagctggagc      960
198 gagtgggcca gcgtgccctg cagctag                                          987
201 <210> SEQ ID NO: 4
202 <211> LENGTH: 987
203 <212> TYPE: DNA
204 <213> ORGANISM: artificial sequence
206 <220> FEATURE:
207 <223> OTHER INFORMATION: codon optimized human IL-12 p40
209 <400> SEQUENCE: 4
210 atgtgccacc agcagctggt gatcagctgg ttctccctgg tgtttctggc cagcccccctc      60
212 gtggccatct gggagctgaa gaaagacgtg tacgtggtcg agctggactg gtaccccgac      120
214 gcccccggcg agatggtggt cctgacctgc gacaccccccg aggaagacgg catcacctgg     180
216 accctggacc agagcagtga ggtgctgggc tccggcaaga ccctgaccat ccaggtgaag      240
218 gagttcggcg acgccggcca gtacacctgc cacaagggag gcgaggtgct gagccactcc      300
220 ctcctgctgc tccacaaaaa ggaggacggc atctggagca ccgacatcct gaaggaccag      360
222 aaggagccca agaacaagac cttcctgcgc tgcgaggcca agaactacag cggccgcttc      420
224 acctgctggt ggctgaccac gatcagcacc gacctgacct tcagtgtgaa gagcagcagg      480
226 ggctccagcg acccccaggg cgtgacctgc ggcgctgcca ccctgagcgc cgagcgcgtg      540
228 cgcggcgaca acaaggagta cgagtacagc gtggagtgcc aggaagactc cgcctgcccc      600
230 gccgctgagg agagcctgcc catcgaggtg atggtggacg ccgttcacaa gctgaagtac      660
232 gagaactaca ccagcagctt cttcatccgc gacatcatca gcctgaccc acccaagaac       720
234 ctccagctga gcccctcaa gaactcccgc caggtggagg tgagctggga gtaccccgac        780
236 acctggagca cgccccactc ctacttctcc ctgaccttct gcgtgcaggt ccagggcaag        840
238 agcaagcgcg agaagaaaga ccgggtgttc accgacaaga ccagcgccac cgtcatctgc      900
240 cgcaagaacg ccagcatcag cgtgcgcgcc caggaccgct actatagctc ctcttggagc      960
242 gagtgggcca gcgtgccctg ctcctag                                          987
245 <210> SEQ ID NO: 5
246 <211> LENGTH: 219
247 <212> TYPE: PRT
248 <213> ORGANISM: homo sapiens
250 <400> SEQUENCE: 5
252 Met Cys Pro Ala Arg Ser Leu Leu Leu Val Ala Thr Leu Val Leu Leu
253 1               5                   10                  15
256 Asp His Leu Ser Leu Ala Arg Asn Leu Pro Val Ala Thr Pro Asp Pro
257             20                  25                  30
260 Gly Met Phe Pro Cys Leu His His Ser Gln Asn Leu Leu Arg Ala Val
```

RAW SEQUENCE LISTING   DATE: 08/23/2004
PATENT APPLICATION: US/09/754,014A   TIME: 16:08:38

Input Set : A:\09-754,014.txt
Output Set: N:\CRF4\08232004\I754014A.raw

```
261         35                    40                   45
264 Ser Asn Met Leu Gln Lys Ala Arg Gln Thr Leu Glu Phe Tyr Pro Cys
265     50                  55                  60
268 Thr Ser Glu Glu Ile Asp His Glu Asp Ile Thr Lys Asp Lys Thr Ser
269 65                  70                  75                  80
272 Thr Val Glu Ala Cys Leu Pro Leu Glu Leu Thr Lys Asn Glu Ser Cys
273              85                  90                  95
276 Leu Asn Ser Arg Glu Thr Ser Phe Ile Thr Asn Gly Ser Cys Leu Ala
277         100                 105                 110
280 Ser Arg Lys Thr Ser Phe Met Met Ala Leu Cys Leu Ser Ser Ile Tyr
281         115                 120                 125
284 Glu Asp Leu Lys Met Tyr Gln Val Glu Phe Lys Thr Met Asn Ala Lys
285     130                 135                 140
288 Leu Leu Met Asp Pro Lys Arg Gln Ile Phe Leu Asp Gln Asn Met Leu
289 145                 150                 155                 160
292 Ala Val Ile Asp Glu Leu Met Gln Ala Leu Asn Phe Asn Ser Glu Thr
293              165                 170                 175
296 Val Pro Gln Lys Ser Ser Leu Glu Glu Pro Asp Phe Tyr Lys Thr Lys
297         180                 185                 190
300 Ile Lys Leu Cys Ile Leu Leu His Ala Phe Arg Ile Arg Ala Val Thr
301     195                 200                 205
304 Ile Asp Arg Val Thr Ser Tyr Leu Asn Ala Ser
305     210                 215
```

308 <210> SEQ ID NO: 6
309 <211> LENGTH: 660
310 <212> TYPE: DNA
311 <213> ORGANISM: homo sapiens
313 <400> SEQUENCE: 6

```
314 atgtgtccag cgcgcagcct cctccttgtg gctaccctgg tcctcctgga ccacctcact    60
316 ttggccagaa acctccccgt ggccactcca gacccaggaa tgttcccatg ccttcaccac   120
318 tcccaaaacc tgctgagggc cgtcagcaac atgctccaga aggccagaca aactctagaa   180
320 ttttaccctt gcacttctga agagattgat catgaagata tcacaaaaga taaaaccagc   240
322 acagtggagg cctgtttacc attggaatta accaagaatg agagttgcct aaattccaga   300
324 gagacctctt tcataactaa tgggagttgc ctggcctcca gaaagacctc tttttatgatg   360
326 gccctgtgcc ttagtagtat ttatgaagac ttgaagatgt accaggtgga gttcaagacc   420
328 atgaatgcaa agcttctgat ggatcctaag aggcagatct ttctagatca aaacatgctg   480
330 gcagttattg atgagctgat gcaggccctg aatttcaaca gtgagactgt gccacaaaaa   540
332 tcctcccttg aagaaccgga tttttataaa actaaaatca agctctgcat acttcttcat   600
334 gctttcagaa ttcgggcagt gactattgac agagtgacga gctatctgaa tgcttcctaa   660
```

337 <210> SEQ ID NO: 7
338 <211> LENGTH: 660
339 <212> TYPE: DNA
340 <213> ORGANISM: artificial sequence
342 <220> FEATURE:
343 <223> OTHER INFORMATION: Codon optimized Human IL-12 p35
345 <400> SEQUENCE: 7

```
346 atgtgccccg cccgcagcct gctgctggtg gccaccctgg tgctgctgga ccacctgagc    60
348 ctggcccgca acctgcccgt ggccaccccc gaccccggca tgttcccctg cctgcaccac   120
350 agccagaacc tgctggcggc cgtgagcaac atgctgcaga aggccgcgca gaccctggag   180
```

```
352 ttctacccct gcaccagcga ggagatcgac cacgaggaca tcaccaagga caagaccagc     240
354 accgtggagg cctgcctgcc cctggagctg accaagaacg agagctgcct gaacagccgc     300
356 gagaccagct tcatcaccaa cggcagctgc ctggccagcc gcaagaccag cttcatgatg     360
358 gccctgtgcc tgagcagcat ctacgaggac ctgaagatgt accaggtgga gttcaagacc     420
360 atgaacgcca agctgctgat ggaccccaag ctccagatct tcctggacca gaacatgctg     480
362 gccgtgatcg acgagctgat gcaggccctg aacttcaaca gcgagaccgt gccccagaag     540
364 agcagcctgg aggagcccga cttctacaag accaagatca agctgtgcat cctgctgcac     600
366 gccttccgca tccgcgccgt gaccatcgac cgcgtgacca gctacctgaa cgccacctga     660
369 <210> SEQ ID NO: 8
370 <211> LENGTH: 660
371 <212> TYPE: DNA
372 <213> ORGANISM: artificial sequence
374 <220> FEATURE:
375 <223> OTHER INFORMATION: codon optimized Human IL-12 p35
377 <400> SEQUENCE: 8
378 atgtgccccg cccgcagcct gctgctcgtg ccaccctgg  tgctcctgga ccacctcagc      60
380 ctggcccgca acctccccgt ggccacccca gaccccggca tgttcccatg cctgcaccac     120
382 agccagaacc tgctggcggc cgtgagcaac atgctgcaga aggccgcgca gacccgtggag    180
384 ttctacccct gcaccagcga ggagatcgac cacgaggaca tcaccaagga caagaccagc     240
386 accgtggagg cctgcctgcc cctcgagtta accaagaacg agagctgcct caacagccgc     300
388 gagacctcct tcatcaccaa cggcacttgc ctggcctccc gcaagaccag cttcatgatg     360
390 gccctgtgcc tgagctccat ctacgaggac ctgaagatgt accaggtgga gttcaagacc     420
392 atgaacgcca agctcctgat ggaccccaag ctccagatct tcctggacca gaacatgctg     480
394 gccgtgatcg acgagctgat gcaggccctg aacttcaaca gcgagaccgt gccccagaag     540
396 agcagcctgg aggagcccga cttctacaag accaagatca agctgtgcat cctgctgcac     600
398 gccttccgca tccgggccgt gaccatcgac cgcgtgacca gctacctgaa cgccacgtga     660
401 <210> SEQ ID NO: 9
402 <211> LENGTH: 58
403 <212> TYPE: DNA
404 <213> ORGANISM: artificial sequence
406 <220> FEATURE:
407 <223> OTHER INFORMATION: synthetic 5' UTR
409 <400> SEQUENCE: 9
410 aagcttactc aacacaataa caaacttact tacaatctta attaacaggc caccatgg        58
413 <210> SEQ ID NO: 10
414 <211> LENGTH: 45
415 <212> TYPE: DNA
416 <213> ORGANISM: artificial sequence
418 <220> FEATURE:
419 <223> OTHER INFORMATION: synthetic intron where tract of random nucleotides not shown
422 <220> FEATURE:
423 <221> NAME/KEY: misc_feature
424 <222> LOCATION: (1)..(9)
425 <223> OTHER INFORMATION: 5' splice site, where actual splice between nucleotide 3 and
427 <220> FEATURE:
428 <221> NAME/KEY: misc_feature
429 <222> LOCATION: (10)..(15)
430 <223> OTHER INFORMATION: optional restriction enzyme site
432 <220> FEATURE:
```

4

RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 08/23/2004
PATENT APPLICATION: US/09/754,014A   TIME: 16:08:39

Input Set : **A:\09-754,014.txt**
Output Set: **N:\CRF4\08232004\I754014A.raw**

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:11; N Pos. 12
Seq#:13; N Pos. 16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
Seq#:13; N Pos. 36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55
Seq#:13; N Pos. 56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75
Seq#:13; N Pos. 76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92
Seq#:16; N Pos. 2
Seq#:18; N Pos. 17
Seq#:19; N Pos. 17

Invalid <213> Response:
Use of "Artificial" only as "<213> Organism" response is incomplete,
per 1.823(b) of New Sequence Rules. Valid response is Artificial Sequence.

Seq#:11,12,13,14,15,16,17,18,19

VERIFICATION SUMMARY   DATE: 08/23/2004
PATENT APPLICATION: **US/09/754,014A**   TIME: 16:08:39

Input Set : **A:\09-754,014.txt**
Output Set: **N:\CRF4\08232004\I754014A.raw**

```
L:468 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:11 after pos.:0
L:529 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:13 after pos.:0
M:341 Repeated in SeqNo=13
L:546 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:14
L:551 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:14
L:556 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:14
L:604 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:0
L:649 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:0
L:672 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:0
```